

Naval Command,
Control and Ocean
Surveillance Center
RDT&E Division

San Diego, CA
92152-5001



NRaD RADAR MEASUREMENT RANGE



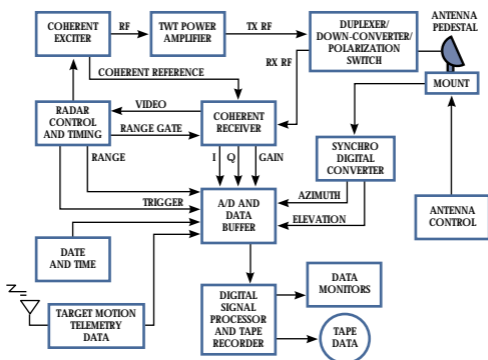
■ The NRaD Radar Measurement Range, located at the Naval Command, Control and Ocean Surveillance Center (NCCOSC) RDT&E Division (NRaD), conducts a variety of measurements on both ships and aircraft. The radar frequency bands are S (3.0–3.5 GHz), X (9.0–9.5 GHz), Ku (13.8–14.3 GHz), and MMW (49.0–49.5 GHz). These operational frequencies can be modified based on program requirements. The radars produce calibrated, high-range resolution, one- and two-dimensional target signatures. Inverse Synthetic Aperture Radar (ISAR) techniques developed at NRaD are used to form the two-dimensional images. The coherent radar uses a variety of waveforms: stepped frequency; chirp (X-band only); and fixed frequency. The radar operational bandwidth is 500 MHz, yielding a range resolution of about 1 ft.

The NRaD Radar Measurement Range has been in operation for over 10 years; many ships, aircraft, and other targets have been tested. For example, over 25 ships have been measured in support of one Naval Sea Systems Command program. NRaD has developed and implemented a method for very accurate calibration of the radar. Spheres suspended under a helicopter serve as primary calibration reference for the radar. This procedure has been used for many years with consistently good results.

The NRaD Radar Measurement Range extends to the west of the Point Loma peninsula. The radar site is located above a cliff on the western side of Point Loma, about 120 feet above sea level. The radar has a clear

180-degree view to the west extending to the horizon (10–13 nmi). The range is convenient to the extensive Naval port and airfield facilities in the San Diego area and provides measurement support of a large variety of surface and airborne targets. San Diego's mild climate permits year-round testing with a low probability of test cancellation.

The Radar System



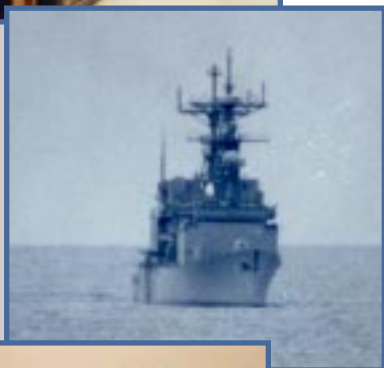
Radar Measurement Capabilities

1. Radar Cross Section (RCS)
 - a. RCS statistics
 - b. Probability density function plots
 - c. Intensity of individual scatterers as a function of aspect angle or time
2. High-range resolution, one-dimensional target signatures
3. High-range resolution, two-dimensional target ISAR images
4. Aircraft engine signal modulation
5. Submarine periscope and wakes
6. Chaff bloom rates
7. Decoy characteristics
8. Sea clutter



Radar
operation
center

USS *Memill*
(DD 976)
during a
radar
measure-
ment

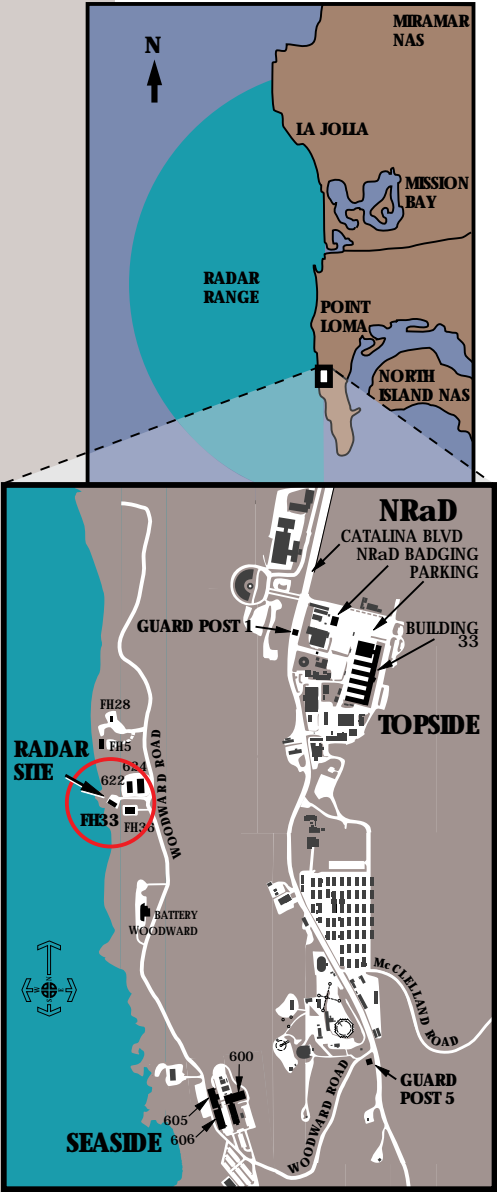


F-14 doing a special maneuver
during radar measurement

Radar
antenna
pedestal



NRaD Radar Measurement Range



 **For further information, contact**

COMMANDING OFFICER

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Reviewed and approved by

A handwritten signature in black ink, appearing to read 'J. Mui', is written over a horizontal line.

**Executive Officer/
Base Operations Manager
NCCOSC RDT&E Division
TD 2660 JULY 1994**

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